

Serial Number: 10/783,340

Filing Date: February 20, 2004

Title: Process for the Preparation of a Coating, a Coated Substrate, an Adhesive, Film or Sheet

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**REMARKS**

Claims 1-3, and 5 are amended, claims 4, 6, and 11 are canceled, claims 7-10 and 12-17 are withdrawn, as a result, claims 1-3, 5, 7-10, and 12-18 are now pending in this application.

Applicant has amended the Abstract in light of the comments made by the Examiner in item 2 of the Office Action dated 12/12/2005.

Applicant has amended the Specification on page 1, line 17 to properly present the change from 30 to 50 in light of the Examiner's comment made in item 3 of the Office Action dated 12/12/2005.

Applicant has amended the Specification on page 2 with a replacement paragraph that begins on line 18 and ends on page 3, line 2.

Applicant has amended the Specification on page 3 with a replacement paragraph that begins on line 14 and ends at line 17.

Applicant has amended the Specification on page 9 by replacing the paragraph beginning on line 37 and ending on line 30 of page 10 to address the Examiner's comment in item 4 of the 12/12/2005 Office Action.

Applicant has amended the Specification on page 3 by deleting the paragraphs beginning on line 38 and ending on line 22 of page 7. Item 5 of the 12/12/2005 Office Action is addressed by this action.

Applicant has amended the Specification on page 7 with a replacement paragraph that begins on line 23 and ends on line 33.

Applicant has amended the Specification on page 7 by deleting the paragraphs that begin on line 34 and ends on line 17 of page 9.

**§112 Rejection of the Claims**

Claims 1-6, 11 and 18 were rejected under 35 USC ' 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Referring now to item 7a on page 4 of the 12/12/2005 Office Action, the word in question has been deleted from the specification via amendment.

Referring now to item 7b on page 5 of the 12/12/2005 Office Action, the word in question has been deleted from the specification via amendment.

Referring now to item 8 on page 5 of the 12/12/2005 Office Action, the phrase in question “which is 50 to 300 °C and is maintained for 1 to 20 minutes without selected additives” finds support in the specification as filed at claim 1, lines 17-18. The specification is currently amended to include the phrase “which is 50 to 300 °C and is maintained for 1 to 20 minutes without selected additives” beginning on page 2 line 18 and ending on page 3, line 2.

Referring now to item 9 on page 5 of the 12/12/2005 Office Action, the number in question was mistyped and is amended to appear as 30.

Claims 1-6, 11, and 18 are rejected under 35 USC § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention.

Referring now to item 11a of the 12/12/2005 Office Action, the word “coating “ refers to substrate. Claim 1 is amended to clarify what the inventor conceives as his invention. In the currently amended claim 1, member words were added in the first line. The first line is now: “A process for preparation of a coating, a coated substrate, a film or a sheet, in which process.....”

Referring now to item 11b, claim 1 is currently amended to include “having a particle size of 0.5 to 200 microns” after powder. This value is based on the value in claim 3 of US 6893683 which claims priority to and the benefit of WO01/23451 which is referenced in the application as filed.

Referring now to item 11c, claim 1 is currently amended to more precisely describe what applicant conceives as his invention. Component A and component B refer to the plurality of elements forming the reactive system.

Referring now to item 11d, since the word selective is too vague we have combined claim 1 with claim 4 in the currently amended claim 1 to further clarify what applicant conceives as his invention.

Referring now to item 11e, Applicant means by “a similar reaction time” the same reaction time. For example, see Example 5, Table 3A, the formation of a coating within 3 min.

requires a temperature of 90 °C in the absence of water as additive, while in the presence of 3 % water, the reaction already occurs at 70 °C. To further clarify we replaced “a similar” with “the same” in claim 1. The same correction was applied at page 2, line 31 of the Specification.

Referring now to items 11f, the word “reactants” is replaced in amended claim 1 by “component A” and “component B”. In this way no confusion is possible about the meaning of the phrase.

Referring now to item 11g, the phrase “the other component” has been deleted.

Referring now to item 11h, the temperature is 50-300 °C for 1 to 20 min without selected additives. The reaction temperature is adjusted to a temperature which is 3-50 °C lower than the reaction temperature in the absence of one or more selected additives by the addition of one or more selected additives.

Referring now to item 11i, first the minimal reaction temperature for the formation of a coating is measured by testing the formation of complete curing of the coating at several temperatures, as pointed out in Examples 5 and 6 and in Example 11 the completeness of the reaction is tested at several times and temperatures by IR-spectroscopy. As soon as the minimal reaction temperature is known this information can be used in the process for the preparation of a film or coating. Since a cured film is formed in examples 5 and 6 these examples represent well how the reaction temperature for the preparation can be adjusted by the addition of the additives. The elements of claim 6 are included in claim 1 to clarify how the reaction temperature is adjusted. Claim 6 has been cancelled. Further concentrations are given based on the values in Examples 5, 6 and 11.

Referring now to item 11j, the phrase is corrected according to the suggestion of the examiner. As mentioned above, elements of claim 4 are incorporated in amended claim 1.

Referring now to item 11k, the part of the text referenced by the Examiner has been removed.

Referring now to item 11l, the word “additive” is replaced by “additives”.

Referring now to item 11m-n, as discussed in response to item 11c, component A) and component B) are introduced in currently amended claim 5 and the requested details are corrected in order to address the comments of the Examiner.

Referring now to item 11o, the term “an additive” in claim 1 is replaced by “one or more selected additives”. This amendment is based on the series of one or more additives which are used in Examples 5 and 6, claims 7-10, Examples 9-10, claims 12 -14 and Example 1. All show that several combinations of additives may be used under several conditions.

Referring now to item 11p, claim 5 is further amended to clarify what Applicant conceives as his invention.

Referring now to item 11q, claim 6 is cancelled. The elements of claim 6 are included in claim 1. The formulation was modified in order to address the Examiner’s comments.

Referring now to item 11r, claim 6 is cancelled. The elements of claim 6 are included in claim 1. The formulation was modified in order to address the Examiner’s comments. The original phrase in the WO patent application was: and/or a surfactant. Surfactant does not modify only a metal catalyst. The combination of a surfactant with other additives is novel (see International Preliminary Examination report). We amended this part of the phrase by: “and in addition 0-5 % of a surfactant” This formulation represents experimental conditions in Example 5.

Referring now to item 11s, claim 6 is cancelled. The elements of claim 6 are included in claim 1. The phrase “the original temperature” has been deleted.

Referring now to item 11t-u, the effect described in claim 11 is related to claims 7-10 which are withdrawn. Therefore claim 11 is cancelled.

The amendments to claims 1-6, 11 and 18 overcome the §112 rejections and place the claims in condition for allowance.

#### §103 Rejection of the Claims

Claims 1-6, 11, and 18 were rejected under 35 USC ' 103(a) as being unpatentable over (WO 01/23451). Applicant traverses the Examiner’s rejection.

The present application and WO 01/23451 are based on the reaction between, among others, a polyisocyanate and a solid polyhydrazide. The present application is an improvement over WO 01/23451 in which the process of WO 01/23451 is improved for several applications by the addition of additives.

The advantages of the modifications by which a lower reaction temperature can be

applied are indicated at page 3 line 33 to 37. These advantages are: the process is now suitable for temperature-sensitive substrates, such as leather. The energy costs are lower when a lower temperature can be applied during the curing. When a coating is applied onto leather a maximal temperature of 80 °C may be used, since leather is a natural material which shrinks and from which the structure modifies at higher temperatures. After cooling down of the leather the original performance is not recovered when the temperature of the leather was too high.

Both in WO 01/23451 and the present application a relative broad initial temperature range is presented. The reason for this is that depending on the type of polyisocyanate-functional, poly-ketone-functional, -polyepoxide-functional, polyanhydride-functional, or polycyclic carbonate-functional compound or polymer (component A) or on the type of polyhydrazide (component B) a different reaction temperature has to be applied to obtain a coating or film. This is illustrated in Example 5 of the present application in which the polyisocyanates are based on different diisocyanates: HDI (hexane diisocyanate), TDI (toluene diisocyanate) and IPDI (isophorone diisocyanate) and two types of polyhydrazides are used: ADH (adipic dihydrazide) and CDH (carbodihydrazide). Some typical effects (out of Example 5) are presented in the table below. It is obvious that especially the type of hydrazide is of importance and that by the addition of a low amount of water the reaction temperature may be reduced. As original temperature also higher temperatures may be of importance because for artificial leather sometimes higher temperatures are required, for example when the coating has to be melted with the surface of a pvc-substrate.

polyurethane	Type of polyisocyanate in polyurethane	Type of polyhydrazide	Minimal temperature of complete curing within 3 min (°C)	Minimal temperature of complete curing within 3 min (°C) in the presence of 3 % of water (°C)
Example 1	HDI	CDH	90	70
			ADH	120
Example 2	TDI	CDH	95	75
Example 3	IPDI	CDH	90	80

The presence of a surfactant was already mentioned in WO 01/23451. The reason that a surfactant was present in WO 01/23451 was that the presence of a small amount of surfactant prevents coagulation of the particles, which has been described previously for malting agents. However, the combination of a surfactant and water as additive has not before been claimed in this system. Therefore the addition of surfactants in the process claims is formulated as "and in addition 0 to 5 % of an ionic or anionic surfactant "in the currently amended claim 1 and is non-obvious over WO 01/23451. The actual surfactants are mentioned at page 10 and in table B at page 15.

Therefore, claims 1-3, 5 and 18 are patentable over WO 01/23451.

Objections to the Claims

Referring now to item 14, Applicant has amended claim 3 to remove the phrase to which the Examiner objects.

Conclusion

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (505 998 6134) to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 13-4213.

Respectfully submitted,



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